Analytical Laboratory

13339 Hagers Ferry Road
Huntersville, NC 28078-7929
McGuire Nuclear Complex - MG03A2
Phone: 980-875-5245 Fax: 980-875-4349

Order Summary Report

Order Number: **J13010310**

Project Name: WWTS - Biweekly (2)

Customer Name(s): Bill K, Wayne C, Melonie M, and Tom J

Customer Address: 3195 Pine Hall Rd
Mailcode: Belews Steam Station
Belews Creek, NC 28012

Lab Contact: Jason C Perkins Phone: 980-875-5348

Report Authorized By: (Signature) Digitally signed by jay perkins DN: cn=jay perkins, o=Analytical Lab, ou, email=jay.perkins@duke-energy.com, c=US Date: 2013.02.11 15:56:17 -05'00'
Jason C Perkins

Date: 2/11/2013

Program Comments:

Please contact the Program Manager (Jason C Perkins) with any questions regarding this report.

Data Flags & Calculations:

Any analytical tests or individual analytes within a test flagged with a Qualifier indicate a deviation from the method quality system or quality control requirement. The qualifier description is found at the end of the Certificate of Analysis (sample results) under the qualifiers heading. All results are reported on a dry weight basis unless otherwise noted. Subcontracted data included on the Duke Certificate of Analysis is to be used as information only. Certified vendor results can be found in the subcontracted lab final report. Duke Energy Analytical Laboratory subcontracts analyses to other vendor laboratories that have been qualified by Duke Energy to perform these analyses except where noted.

Data Package:

This data package includes analytical results that are applicable only to the samples described in this narrative. An estimation of the uncertainty of measurement for the results in the report is available upon request. This report shall not be reproduced, except in full, without the written consent of the Analytical Laboratory. Please contact the Analytical laboratory with any questions. The order of individual sections within this report is as follows:

Job Summary Report, Sample Identification, Technical Validation of Data Package, Analytical Laboratory Certificate of Analysis, Analytical Laboratory QC Reports, Sub-contracted Laboratory Results, Customer Specific Data Sheets, Reports & Documentation, Customer Database Entries, Test Case Narratives, Chain of Custody (COC)

Certification:

The Analytical Laboratory holds the following State Certifications : North Carolina (DENR) Certificate #248, South Carolina (DHEC) Laboratory ID # 99005. Contact the Analytical Laboratory for definitive information about the certification status of specific methods.

Sample ID's & Descriptions:

Sample ID	Plant/Station	Collection Date and Time	Collected By	Sample Description
2013001267	BELEWS	23-Jan-13 8:10 AM	TRAVIS THORNTON	FGD Purge Eff
2013001268	BELEWS	23-Jan-13 8:15 AM	TRAVIS THORNTON	EQ TANK EFF.
2013001269	BELEWS	23-Jan-13 8:20 AM	TRAVIS THORNTON	BIOREACTOR 1 INF.
2013001270	BELEWS	23-Jan-13 8:25 AM	TRAVIS THORNTON	BIOREACTOR 2 INF.
2013001271	BELEWS	23-Jan-13 8:30 AM	TRAVIS THORNTON	BIOREACTOR 2 EFF.
2013001272	BELEWS	23-Jan-13 8:35 AM	TRAVIS THORNTON	FILTER BLANK
2013001273	BELEWS	17-Jan-13 1:45 PM	C.KNOX	Trip Blank

7 Total Samples

Technical Validation Review

Checklist:

COC and .pdf report are in agreement with sample totals and analyses (compliance programs and procedures).	☑ Yes	☐ No
All Results are less than the laboratory reporting limits.	☐ Yes	☑ No
All laboratory QA/QC requirements are acceptable.	☑ Yes	☐ No

The following vendor labs are Pending Qualifi Applied Speciation

Report Sections Included:

- ☑ Job Summary Report
- ☑ Sample Identification
- ☑ Technical Validation of Data Package
- ☑ Analytical Laboratory Certificate of Analysis
- ☐ Analytical Laboratory QC Report
- ☑ Sub-contracted Laboratory Results
- ☐ Customer Specific Data Sheets, Reports, & Documentation
- ☐ Customer Database Entries
- ☑ Chain of Custody
- ☑ Electronic Data Deliverable (EDD) Sent Separately

Reviewed By: DBA Account Date: 2/11/2013

Certificate of Laboratory Analysis

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Order # J13010310

Site: FGD Purge Eff **Sample #: 2013001267**

Collection Date: 23-Jan-13 8:10 AM Matrix: OTHER

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
INORGANIC IONS BY IC								
Bromide	**100**	mg/L		5	50	EPA 300.0	01/28/2013 20:12	JAHERMA
MERCURY (COLD VAPOR) IN WATER								
Mercury (Hg)	**188**	ug/L		5	100	EPA 245.1	01/31/2013 14:03	AGIBBS
DISSOLVED METALS BY ICP								
Manganese (Mn)	**9.57**	mg/L		0.05	10	EPA 200.7	01/29/2013 12:08	MHH7131
TOTAL RECOVERABLE METALS BY ICP								
Boron (B)	**207**	mg/L		0.5	10	EPA 200.7	01/29/2013 12:08	MHH7131
Manganese (Mn)	**10.3**	mg/L		0.05	10	EPA 200.7	01/29/2013 12:08	MHH7131
DISSOLVED METALS BY ICP-MS								
Selenium (Se)	**442**	ug/L		10	10	EPA 200.8	01/24/2013 12:50	KRICHAR
TOTAL RECOVERABLE METALS BY ICP-MS								
Arsenic (As)	**537**	ug/L		10	10	EPA 200.8	02/01/2013 13:53	KRICHAR
Chromium (Cr)	**461**	ug/L		10	10	EPA 200.8	02/01/2013 13:53	KRICHAR
Copper (Cu)	**388**	ug/L		10	10	EPA 200.8	02/01/2013 13:53	KRICHAR
Nickel (Ni)	**469**	ug/L		10	10	EPA 200.8	02/01/2013 13:53	KRICHAR
Selenium (Se)	**3060**	ug/L		10	10	EPA 200.8	02/01/2013 13:53	KRICHAR
Silver (Ag)	**< 10**	ug/L		10	10	EPA 200.8	02/01/2013 13:53	KRICHAR
Zinc (Zn)	**722**	ug/L		10	10	EPA 200.8	02/01/2013 13:53	KRICHAR
SELENIUM SPECIATION - (Analysis Performed by Applied Speciation and Consulting, LLC)								
Vendor Parameter	**Complete**					Vendor Method		V_AS&C
TOTAL DISSOLVED SOLIDS								
TDS	**21000**	mg/L		200	1	SM2540C	01/30/2013 16:20	SWILLI3

Site: EQ TANK EFF. **Sample #: 2013001268**

Collection Date: 23-Jan-13 8:15 AM Matrix: OTHER

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
MERCURY (COLD VAPOR) IN WATER								
Mercury (Hg)	**136**	ug/L		2.5	50	EPA 245.1	01/31/2013 14:05	AGIBBS
DISSOLVED METALS BY ICP								
Manganese (Mn)	**7.73**	mg/L		0.05	10	EPA 200.7	01/29/2013 12:12	MHH7131
TOTAL RECOVERABLE METALS BY ICP								
Boron (B)	**197**	mg/L		0.5	10	EPA 200.7	01/29/2013 12:12	MHH7131
Manganese (Mn)	**8.78**	mg/L		0.05	10	EPA 200.7	01/29/2013 12:12	MHH7131

Certificate of Laboratory Analysis

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Order # J13010310

Site: EQ TANK EFF. **Sample #: 2013001268**

Collection Date: 23-Jan-13 8:15 AM Matrix: OTHER

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
DISSOLVED METALS BY ICP-MS								
Selenium (Se)	**183**	ug/L		10	10	EPA 200.8	01/24/2013 12:54	KRICHAR
TOTAL RECOVERABLE METALS BY ICP-MS								
Arsenic (As)	**439**	ug/L		10	10	EPA 200.8	02/01/2013 13:57	KRICHAR
Chromium (Cr)	**375**	ug/L		10	10	EPA 200.8	02/01/2013 13:57	KRICHAR
Copper (Cu)	**319**	ug/L		10	10	EPA 200.8	02/01/2013 13:57	KRICHAR
Nickel (Ni)	**391**	ug/L		10	10	EPA 200.8	02/01/2013 13:57	KRICHAR
Selenium (Se)	**2890**	ug/L		10	10	EPA 200.8	02/01/2013 13:57	KRICHAR
Silver (Ag)	**< 10**	ug/L		10	10	EPA 200.8	02/01/2013 13:57	KRICHAR
Zinc (Zn)	**593**	ug/L		10	10	EPA 200.8	02/01/2013 13:57	KRICHAR

Site: BIOREACTOR 1 INF. **Sample #: 2013001269**

Collection Date: 23-Jan-13 8:20 AM Matrix: OTHER

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
DISSOLVED METALS BY ICP								
Manganese (Mn)	**0.943**	mg/L		0.05	10	EPA 200.7	01/29/2013 12:16	MHH7131
TOTAL RECOVERABLE METALS BY ICP								
Boron (B)	**171**	mg/L		0.5	10	EPA 200.7	01/29/2013 12:16	MHH7131
Manganese (Mn)	**0.952**	mg/L		0.05	10	EPA 200.7	01/29/2013 12:16	MHH7131
DISSOLVED METALS BY ICP-MS								
Selenium (Se)	**117**	ug/L		10	10	EPA 200.8	01/24/2013 12:57	KRICHAR
TOTAL RECOVERABLE METALS BY ICP-MS								
Arsenic (As)	**< 10**	ug/L		10	10	EPA 200.8	02/01/2013 14:00	KRICHAR
Chromium (Cr)	**< 10**	ug/L		10	10	EPA 200.8	02/01/2013 14:00	KRICHAR
Copper (Cu)	**< 10**	ug/L		10	10	EPA 200.8	02/01/2013 14:00	KRICHAR
Nickel (Ni)	**13.8**	ug/L		10	10	EPA 200.8	02/01/2013 14:00	KRICHAR
Selenium (Se)	**118**	ug/L		10	10	EPA 200.8	02/01/2013 14:00	KRICHAR
Silver (Ag)	**< 10**	ug/L		10	10	EPA 200.8	02/01/2013 14:00	KRICHAR
Zinc (Zn)	**< 10**	ug/L		10	10	EPA 200.8	02/01/2013 14:00	KRICHAR
SELENIUM SPECIATION - (Analysis Performed by Applied Speciation and Consulting, LLC)								
Vendor Parameter	**Complete**					Vendor Method		V_AS&C

Certificate of Laboratory Analysis

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Order # J13010310

Site: BIOREACTOR 2 INF. **Sample #: 2013001270**

Collection Date: 23-Jan-13 8:25 AM Matrix: OTHER

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
TOTAL RECOVERABLE METALS BY ICP								
Boron (B)	**162**	mg/L		0.5	10	EPA 200.7	01/29/2013 12:20	MHH7131
Manganese (Mn)	**0.940**	mg/L		0.05	10	EPA 200.7	01/29/2013 12:20	MHH7131
TOTAL RECOVERABLE METALS BY ICP-MS								
Arsenic (As)	**< 10**	ug/L		10	10	EPA 200.8	02/01/2013 14:04	KRICHAR
Chromium (Cr)	**< 10**	ug/L		10	10	EPA 200.8	02/01/2013 14:04	KRICHAR
Copper (Cu)	**< 10**	ug/L		10	10	EPA 200.8	02/01/2013 14:04	KRICHAR
Nickel (Ni)	**< 10**	ug/L		10	10	EPA 200.8	02/01/2013 14:04	KRICHAR
Selenium (Se)	**23.0**	ug/L		10	10	EPA 200.8	02/01/2013 14:04	KRICHAR
Silver (Ag)	**< 10**	ug/L		10	10	EPA 200.8	02/01/2013 14:04	KRICHAR
Zinc (Zn)	**< 10**	ug/L		10	10	EPA 200.8	02/01/2013 14:04	KRICHAR

Site: BIOREACTOR 2 EFF. **Sample #: 2013001271**

Collection Date: 23-Jan-13 8:30 AM Matrix: OTHER

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
INORGANIC IONS BY IC								
Bromide	**84**	mg/L		5	50	EPA 300.0	01/28/2013 20:31	JAHERMA
MERCURY (COLD VAPOR) IN WATER								
Mercury (Hg)	**< 1**	ug/L		1	20	EPA 245.1	01/31/2013 14:07	AGIBBS
TOTAL RECOVERABLE METALS BY ICP								
Boron (B)	**155**	mg/L		0.5	10	EPA 200.7	01/29/2013 12:24	MHH7131
Manganese (Mn)	**1.01**	mg/L		0.05	10	EPA 200.7	01/29/2013 12:24	MHH7131
TOTAL RECOVERABLE METALS BY ICP-MS								
Arsenic (As)	**< 5**	ug/L		5	5	EPA 200.8	02/01/2013 14:07	KRICHAR
Chromium (Cr)	**< 5**	ug/L		5	5	EPA 200.8	02/01/2013 14:07	KRICHAR
Copper (Cu)	**< 5**	ug/L		5	5	EPA 200.8	02/01/2013 14:07	KRICHAR
Nickel (Ni)	**< 5**	ug/L		5	5	EPA 200.8	02/01/2013 14:07	KRICHAR
Selenium (Se)	**5.82**	ug/L		5	5	EPA 200.8	02/01/2013 14:07	KRICHAR
Silver (Ag)	**< 5**	ug/L		5	5	EPA 200.8	02/01/2013 14:07	KRICHAR
Zinc (Zn)	**< 5**	ug/L		5	5	EPA 200.8	02/01/2013 14:07	KRICHAR
SELENIUM SPECIATION - (Analysis Performed by Applied Speciation and Consulting, LLC)								
Vendor Parameter	**Complete**					Vendor Method		V_AS&C

Certificate of Laboratory Analysis

Order # J13010310

Site: FILTER BLANK **Sample #: 2013001272**

Collection Date: 23-Jan-13 8:35 AM Matrix: OTHER

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
DISSOLVED METALS BY ICP								
Manganese (Mn)	**< 0.005**	mg/L		0.005	1	EPA 200.7	01/28/2013 11:40	MHH7131
DISSOLVED METALS BY ICP-MS								
Selenium (Se)	**< 1**	ug/L		1	1	EPA 200.8	01/24/2013 12:44	KRICHAR

Site: Trip Blank **Sample #: 2013001273**

Collection Date: 17-Jan-13 1:45 PM Matrix: OTHER

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
TOTAL RECOVERABLE METALS BY ICP								
Boron (B)	**< 0.05**	mg/L		0.05	1	EPA 200.7	01/29/2013 12:04	MHH7131
Manganese (Mn)	**< 0.005**	mg/L		0.005	1	EPA 200.7	01/29/2013 12:04	MHH7131
TOTAL RECOVERABLE METALS BY ICP-MS								
Arsenic (As)	**< 1**	ug/L		1	1	EPA 200.8	02/01/2013 13:50	KRICHAR
Chromium (Cr)	**< 1**	ug/L		1	1	EPA 200.8	02/01/2013 13:50	KRICHAR
Copper (Cu)	**< 1**	ug/L		1	1	EPA 200.8	02/01/2013 13:50	KRICHAR
Nickel (Ni)	**< 1**	ug/L		1	1	EPA 200.8	02/01/2013 13:50	KRICHAR
Selenium (Se)	**< 1**	ug/L		1	1	EPA 200.8	02/01/2013 13:50	KRICHAR
Silver (Ag)	**< 1**	ug/L		1	1	EPA 200.8	02/01/2013 13:50	KRICHAR
Zinc (Zn)	**< 1**	ug/L		1	1	EPA 200.8	02/01/2013 13:50	KRICHAR

SELENIUM SPECIATION - (Analysis Performed by Applied Speciation and Consulting, LLC)

Vendor Parameter	**Complete**	Vendor Method	V_AS&C

APPLIED SPECIATION
AND CONSULTING, LLC

18804 Northcreek Parkway Bothell, WA, 98011
Tel: (425) 483-3300 Fax: (425) 483-9818
www.appliedspeciation.com

February 7, 2013

Jay Perkins
Duke Energy Analytical Laboratory
Mail Code MGO3A2 (Building 7405)
13339 Hagers Ferry Rd.
Huntersville, NC 28078
(704) 875-5245

Project: Belews - FGD WWTS Bi-Monthly Sampling) (LIMS #J13010310)

Dear Mr. Perkins,

Attached is the report associated with four (4) aqueous samples submitted for selenium speciation on January 24, 2013. The samples were received in a sealed cooler at -0.1°C on January 25, 2013. Selenium speciation analysis was performed via ion chromatography inductively coupled plasma collision reaction cell mass spectrometry (IC-ICP-CRC-MS). Any issues associated with the analysis are addressed in the following report.

If you have any questions, please feel free to contact me at your convenience.

Sincerely,

Russell Gerads
Vice President
Applied Speciation and Consulting, LLC

Applied Speciation and Consulting, LLC

Report prepared for:

Jay Perkins
Duke Energy Analytical Laboratory
Mail Code MGO3A2 (Building 7405)
13339 Hagers Ferry Rd.
Huntersville, NC 28078

Project: Belews - FGD WWTS Bi-Monthly Sampling) (LIMS #J13010310)

February 7, 2013

1. Sample Reception

Four (4) aqueous samples in 125mL HDPE bottles (provided by Applied Speciation and Consulting) were submitted for selenium speciation analysis on January 24, 2013. The samples were received on January 25, 2013 in a sealed container at -0.1°C.

The samples were received in a laminar flow clean hood, void of trace metals contamination and ultra-violet radiation, and were designated discrete sample identifiers. An aliquot of each sample was filtered (0.45µm) and each filtrate was stored in a secure, monitored cryofreezer (maintained at a temperature of -80^{o}C) until selenium speciation analysis could be performed via ion chromatography inductively coupled plasma collision reaction cell mass spectrometry (IC-ICP-CRC-MS).

2. Sample Preparation

All sample preparation is performed in laminar flow clean hoods known to be free from trace metals contamination. All applied water for dilutions and sample preservatives are monitored for contamination to account for any biases associated with the sample results.

Selenium Speciation Analysis by IC-ICP-CRC-MS Prior to analysis, an aliquot of each sample was filtered with a syringe filter (0.45µm) and injected directly into an autosampler vial. No further sample preparation was performed as any chemical alteration of a sample may shift the equilibrium of the system, resulting in changes in speciation ratios.

3. Sample Analysis

All sample analysis is preceded by a minimum of a five-point calibration curve spanning the entire concentration range of interest. Calibration curves are performed at the beginning of

each analytical day. All calibration curves, associated with each species of interest, are standardized by linear regression resulting in a response factor. All sample results are **instrument blank corrected** to account for any operational biases associated with the analytical platform.

Prior to sample analysis, all calibration curves are verified using second source standards which are identified as initial calibration verification standards (ICV).

Ongoing instrument performance is identified by the analysis of continuing calibration verification standards (CCV) and continuing calibration blanks (CCB) at a minimum interval of every ten analytical runs.

Selenium Speciation Analysis by IC-ICP-CRC-MS Each sample for selenium speciation analysis was analyzed by ion chromatography inductively coupled plasma collision reaction cell mass spectrometry (IC-ICP-CRC-MS) on January 30, 2013. An aliquot of each sample is injected onto an anion exchange column and mobilized by a basic (pH > 7) gradient. The eluting selenium species are then introduced into a radio frequency (RF) plasma where energy-transfer processes cause desolvation, atomization, and ionization. The ions are extracted from the plasma through a differentially-pumped vacuum interface and travel through a pressurized chamber (CRC) containing a reaction gas which preferentially reacts with interfering ions of the same target mass to charge ratios (m/z). A solid-state detector detects ions transmitted through the mass analyzer and the resulting current is processed by a data handling system.

Retention times for each eluting species are compared to known standards for species identification.

4. Analytical Issues

The overall analyses went well and no significant analytical issues were encountered. All quality control parameters associated with the samples were within acceptance limits.

The estimated method detection limits (eMDLs) for selenite, selenate, and selenocyanate are generated from replicate analyses of the lowest standard in the calibration curve. Not all selenium species are present in preparation blanks; therefore, eMDL calculations based on preparation blanks are artificially biased low.

The eMDL for methylseleninic acid and selenomethionine is calculated from the average eMDL of selenite, selenate, and selenocyanate. The calibration does not contain methylseleninic acid or selenomethionine due to impurities in these standards which would bias the results for other selenium species.

If you have any questions or concerns regarding this report, please feel free to contact me.

Sincerely,

Russell Gerads
Vice President
Applied Speciation and Consulting, LLC

Selenium Speciation Results for Duke Energy
Project Name: Belews - FGD WWTS Bi-Monthly Sampling)
Contact: Jay Perkins
LIMS #J13010310

Date: February 7, 2013
Report Generated by: Russell Gerads
Applied Speciation and Consulting, LLC

Sample Results

Sample ID	Se(IV)	Se(VI)	SeCN	MeSe(IV)	SeMe	Unknown Se Species (n)
FGD Purge Eff	269	58.6	ND (<5.2)	ND (<6.3)	ND (<6.3)	0.0 (0)
BioReactor 1 Inf	14.7	56.0	ND (<1.3)	ND (<1.6)	ND (<1.6)	0.0 (0)
BioReactor 2 Eff	ND (<2.5)	ND (<0.95)	ND (<1.3)	ND (<1.6)	ND (<1.6)	0.0 (0)
Metals Trip Blk	ND (<0.098)	ND (<0.038)	ND (<0.052)	ND (<0.063)	ND (<0.063)	0.0 (0)

All results reflect the applied dilution and are reported in µg/L
ND = Not detected at the applied dilution
SeCN = Selenocyanate
MeSe(IV) = Methylseleninic acid
SeMe = Selenomethionine
Unknown Se Species = Total concentration of all unknown Se species observed by IC-ICP-MS

Selenium Speciation Results for Duke Energy
Project Name: Belews - FGD WWTS Bi-Monthly Sampling)
Contact: Jay Perkins
LIMS #J13010310

Date: February 7, 2013
Report Generated by: Russell Gerads
Applied Speciation and Consulting, LLC

Quality Control Summary - Preparation Blank Summary

Analyte (µg/L)	PBW1	PBW2	PBW3	PBW4	Mean	StdDev	eMDL*	eMDL 10x	eMDL 250x	eMDL 1000x
Se(IV)	0.000	0.000	0.000	0.000	0.000	0.000	0.010	0.098	2.5	9.8
Se(VI)	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.038	0.95	3.8
SeCN	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.052	1.3	5.2
MeSe(IV)	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.063	1.6	6.3
SeMe	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.063	1.6	6.3

eMDL = Estimated Method Detection Limit
*Please see narrative regarding eMDL calculations

Quality Control Summary - Certified Reference Materials

Analyte (µg/L)	CRM	True Value	Result	Recovery
Se(IV)	LCS	9.57	9.64	100.8
Se(VI)	LCS	9.48	9.01	95.1
SeCN	LCS	8.92	8.50	95.2
MeSe(IV)	LCS	6.47	6.09	94.2
SeMe	LCS	9.32	8.58	92.0

Selenium Speciation Results for Duke Energy
Project Name: Belews - FGD WWTS Bi-Monthly Sampling)
Contact: Jay Perkins
LIMS #J13010310

Date: February 7, 2013
Report Generated by: Russell Gerads
Applied Speciation and Consulting, LLC

Quality Control Summary - Matrix Duplicates

Analyte (µg/L)	Sample ID	Rep 1	Rep 2	Mean	RPD
Se(IV)	Batch QC	5.80	5.27	5.5	9.7
Se(VI)	Batch QC	ND (<0.95)	ND (<0.95)	NC	NC
SeCN	Batch QC	ND (<1.3)	ND (<1.3)	NC	NC
MeSe(IV)	Batch QC	ND (<1.6)	ND (<1.6)	NC	NC
SeMe	Batch QC	ND (<1.6)	ND (<1.6)	NC	NC

ND = Not detected at the applied dilution
NC = Value was not calculated due to one or more concentrations below the eMDL

Quality Control Summary - Matrix Spike/ Matrix Spike Duplicate

Analyte (µg/L)	Sample ID	Spike Conc	MS Result	Recovery	Spike Conc	MSD Result	Recovery	RPD
Se(IV)	Batch QC	1390	1272	91.1	1390	1256	90.0	1.3
Se(VI)	Batch QC	1261	1049	83.2	1261	1031	81.8	1.7
SeCN	Batch QC	1144	879.6	76.9	1144	867.2	75.8	1.4

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST FORM

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[19]Page 1 of 2
DISTRIBUTION
ORIGINAL to LAB,
COPY to CLIENT

Duke Energy

Duke Energy Analytical Laboratory
Mail Code MGO3A2 (Building 7405)
13339 Hagers Ferry Rd
Huntersville, N. C. 28078
(704) 875-5245
Fax: (704) 875-4349

Analytical Laboratory Use Only

ORDER#: J13010310
MATRIX: OTHER
Samples Originating From: NC___ SC___
Logged By: JT
Date & Time: 1-24-13 1050
SAMPLE PROGRAM: Ground Water ___ NPDES ___ Drinking Water ___ UST ___ RCRA Waste ___
Cooler Temp (C)

AS&C
PO#133241

MR #

1)Project Name: Belews - FGD
2)Phone No:
2) Client: Bill Kennedy, Melonie Martin, Wayne Chapman, Tom Johnson **
4)Fax No:
5)Business Unit:
6)Process:
Mail Code:
8)Oper. Unit:
9)Res. Type:
10)Reso. Center:

Customer to complete all appropriate non-shaded areas.

[15]Preserv.: 1=HCL 2=H_2SO_4 3=HNO_3 4=Ice 5=None

LAB USE ONLY [11]Lab ID	Se Speciation Bottle ID	[13]Sample Description or ID	Date	Time	Signature	[17]Comp.	[18]Grab	TDS	Br (Dionex)	Metals* + Hg**	Mn (ICP) Se (IMS), sol.	Se, speciation - vendor to (Important to place filled bottle back into both baggies)
					[16]Analyses Required — Preserv.			4	4	3,4	3,4	4
2013001267		FGD Purge Eff	1-23	8:10	Travis Thornton	8		1	1	1	1	1
68		EQ Tank Eff.	1-23	8:15		5				1	1	
69		BioReactor 1 Inf	1-23	8:20		5				1**	1	1
70		BioReactor 2 Inf	1-23	8:25		2				1**		
71		BioReactor 2 Eff	1-23	8:30		5			1	1		1
72		Filter Blk	1-23	8:35		2					1	
73		Metals Trip Blk	1-17	1345	[signature]	3				1**		1

Filtering of the Se is performed in the field please provide a filter blank too.

1) Relinquished By: Travis Thornton	Date/Time: 1-23-13 14:00	2) Accepted By: [signature]	Date/Time: 1-24-13 1030
3) Relinquished By	Date/Time	4) Accepted By: Nancy Cullinan	Date/Time: 1/25/13 9:15 Temp: -0.1°c
5)Relinquished By	Date/Time	6)Accepted By:	Date/Time
7)Relinquished By: [signature]	Date/Time: 1-24-13	8)Accepted By:	Date/Time
9)Seal/Locked By: [signature]	Date/Time: 1-24-13	10) Seal/Lock Opened By	Date/Time
11)Seal/Locked By	Date/Time	12)Seal/Lock Opened By	Date/Time

[22]Requested Turnaround
14 Days ______
*7 Days ______
*48 Hr ______
*Other ______
* Add. Cost Will Apply

Comments
* B, Mn by TRM/ICP   As, Cr, Cu, Ni, Se, Ag, Zn by TRM/IMS   thomas.d.johnson@siemens.com

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST FORM

Duke Energy[SM]

Duke Energy Analytical Laboratory
Mail Code MGO3A2 (Building 7405)
13339 Hagers Ferry Rd
Huntersville, N. C. 28078
(704) 875-5245
Fax: (704) 875-4349

Analytical Laboratory Use Only

ORDER#: J13010310
MATRIX: OTHER
Samples Originating From: NC___ SC___
Logged By: JT
Date & Time: 1-24-13 1050
SAMPLE PROGRAM: Ground Water___ NPDES___ Drinking Water___ UST___ RCRA Waste___
Cooler Temp (C)
MR #

DISTRIBUTION
ORIGINAL to LAB,
COPY to CLIENT

Customer must Complete

1)Project Name	Belews - FGD WWTS Bi-Monthly Sampling)	2)Phone No:	
2) Client:	Bill Kennedy, Melonie Martin, Wayne Chapman, Tom Johnson **	4)Fax No:	
5)Business Unit:	6)Process:		Mail Code:
8)Oper. Unit:	9)Res. Type:	10)Reso. Center:	

AS&C
PO#133241

Customer to complete all appropriate non-shaded areas.

Sampling conducted: 2nd and 4th Wednesday

[15]Preserv.: 1=HCL 2=H_2SO_4 3=HNO_3 4=Ice 5=None

[16]Analyses Required

Customer to complete appropriate columns to right

LAB USE ONLY [11]Lab ID	Se Speciation Bottle ID	[13]Sample Description or ID	Date	Time	Signature	[17]Comp.	[18]Grab	TDS		Br (Dionex)	Metals* + Hg**	Mn (ICP) Se (IMS), sol.					Se, speciation - vendor to AS&C (Important to place filled bottle back into both baggies)				
Preserv.								4		4	3,4	3,4					4				
2013001267		FGD Purge Eff	1-23	8:10	[signature]	8		1		1	1	1					1				
68		EQ Tank Eff.	1-23	8:15		5					1	1									
69		BioReactor 1 Inf	1-23	8:20		5					1**	1					1				
70		BioReactor 2 Inf	1-23	8:25		2					1**										
71		BioReactor 2 Eff	1-23	8:30		5				1	1						1				
72		Filter Blk	1-23	8:35		2						1									
73		Metals Trip Blk	1-17	1345	cpbnort	3					1**						1				

Filtering of the Se is performed in the field please provide a filter blank too.

Customer to sign & date below - fill out from left to right.

1) Relinquished By: Travis Thornton	Date/Time: 1-23-13 14:00	2) Accepted By: [signature]	Date/Time: 1-24-13 1030
3) Relinquished By	Date/Time	4) Accepted By	Date/Time
5)Relinquished By	Date/Time	6)Accepted By:	Date/Time
7)Relinquished By	Date/Time	8)Accepted By:	Date/Time
9)Seal/Locked By	Date/Time	10) Seal/Lock Opened By	Date/Time
11)Seal/Locked By	Date/Time	12)Seal/Lock Opened By	Date/Time

Customer, IMPORTANT! Please indicate desired turnaround.

[22]**Requested Turnaround**

14 Days ______

*7 Days ______

*48 Hr ______

*Other ______

* Add. Cost Will Apply

Comments

* B, Mn by TRM/ICP As, Cr, Cu, Ni, Se, Ag, Zn by TRM/IMS 1**=No Hg thomas.d.johnson@siemens.com